

# CentreCOM® FS980M Series

## Fast Ethernet Managed Access Switches

Allied Telesis CentreCOM FS980M switches feature centralized network management via Allied Telesis Autonomous Management Framework™ (AMF), and a redundant system with Virtual Chassis Stacking (VCStack™). These high-performing switches deliver flexible uplink connectivity and lower management costs.



### Overview

FS980M switches provide high-performance Fast Ethernet connectivity right where you need it—at the network edge. Flexible and robust, the FS980M series provide total security and management features for enterprises of all sizes. They also support video surveillance and Point of Sale (POS) applications.

Reduce network running costs by automating and simplifying many day-to-day tasks—an FS980M is the ideal AMF edge switch when an AMF Master switch is available in the network.

With both copper and Power over Ethernet (PoE) models, the FS980M Series has the ideal solution for your network. All models are available with 8, 16, 24 and 48 × 10/100TX Fast Ethernet ports. PoE models support the IEEE 802.3at (PoE+) standard, delivering up to 30 Watts of power per port for video surveillance and security applications. The dual power supply model provides system and PoE redundancy to maximize network and end-point uptime.

## Key Features

### Allied Telesis Autonomous Management Framework™ (AMF)

- ▶ AMF is a sophisticated suite of management tools that provides a simplified approach to network management. Common tasks are automated, or made so simple, that your network can run without the need for highly-trained and expensive network engineers. Powerful features like centralized management, auto-backup, auto-upgrade, auto-provisioning and auto-recovery enable Plug-and-Play networking and zero-touch management.
- ▶ AMF secure mode increases network security with management traffic encryption, authorization, and monitoring.
- ▶ The FS980M can function as an AMF edge switch when an AMF Master switch is available in the network.

### EPSRing™

- ▶ Ethernet Protection Switched Ring (EPSRing) allows several FS980M switches to join a protected ring, capable of recovery within as little as 50ms. This feature is perfect for high availability in enterprise networks.

### Layer 3 Routing

- ▶ The FS980M Series provides static IPv4 routing at the edge of the network, as well as support for RIPv1 and RIPv2.

### VCStack™

- ▶ FS980M/28, FS980M/28PS, FS980M/52, FS980M/52PS, FS980M/28DP models.
- ▶ Create a VCStack of up to four units with 2 Gbps of stacking bandwidth per each unit. VCStack provides a highly-available system in which network resources are spread out across stacked units, minimizing the impact should any unit fail.

### Centralized Power with PoE+

- ▶ PoE+ provides centralized power connection to media, cameras, IP phones and wireless access points.
- ▶ PoE+ reduces costs and offers greater flexibility with the capability to connect devices requiring more power (up to 30W), such as pan-tilt-zoom security cameras.
- ▶ PoE power redundancy is available with a dual power supply model, to ensure critical powered devices remain online.

### System/PoE Redundancy

- ▶ The FS980M/28DP has dual power supplies to further increase reliability.

### Security at the Edge

- ▶ The edge is the most vulnerable point of the network—the FS980M Series protects you with a full set of security features including Multi Supplicant Authentication, IEEE 802.1x, RADIUS, TACACS+, and Dynamic VLAN.
- ▶ Guest VLAN ensures visitors or unauthorized users can only connect to user-defined services—for example, Internet only.
- ▶ Access Control Lists (ACLs) enable inspection of incoming frames and classify them based on various criteria. Specific actions are applied to effectively manage the network traffic. Typically, ACLs are used as a security mechanism, either permitting or denying entry.





## Specifications

### Physical Specifications

PRODUCT	10/100T (RJ-45) COPPER PORTS	10/100/1000T (RJ-45) COPPER PORTS	100/1000X SFP PORTS	SWITCHING FABRIC	FORWARDING RATE	WIDTH X DEPTH X HEIGHT	WEIGHT	
							UNPACKAGED	PACKAGED
FS980M/9	8	1 combo	1combo	3.6	2.68 Mpps	330 x 204 x 43.6 mm (13.0 x 8.0 x 1.7 in))	2.0 kg (4.41 lb)	3.7 kg (8.2 lb)
FS980M/9PS	8	1 combo	1combo	3.6	2.68 Mpps	330 x 204 x 43.6 mm (13.0 x 8.0 x 1.7 in)	2.5 kg (5.51 lb)	4.2 kg (9.3 lb)
FS980M/18	16	2 combo	2 combo	7.2	5.36 Mpps	330 x 204 x 43.6 mm (13.0 x 8.0 x 1.7 in)	2.15 kg (4.74 lb)	4.0 kg (8.8 lb)
FS980M/18PS	16	2 combo	2 combo	7.2	5.36 Mpps	440 x 257 x 43.2 mm (17.3 x 10.1 x 1.7 in)	3.6 kg (7.94 lb)	5.7 kg (12.5 lb)
FS980M/28	24	-	4	12.8	9.52 Mpps	440 x 257 x 43.2 mm (17.3 x 10.1 x 1.7 in)	3.2 kg (7.05 lb)	5.3 kg (11.7 lb)
FS980M/28PS	24	-	4	12.8	9.52 Mpps	440 x 345 x 43.2 mm (17.3 x 13.6 x 1.7 in)	5.1 kg (11.24 lb)	7.6 kg (16.8 lb)
FS980M/28DP	24	-	4	12.8	9.52 Mpps	440 x 425 x 44 mm (17.3 x 16.7 x 1.7 in)	TBD	TBD
FS980M/52	48	-	4	17.6	13.09 Mpps	440 x 257 x 43.2 mm (17.3 x 10.1 x 1.7 in)	3.4 kg (7.50 lb)	5.6 kg (12.3 lb)
FS980M/52PS	48	-	4	17.6	13.09 Mpps	440 x 345 x 43.2 mm (17.3 x 13.6 x 1.7 in)	5.4 kg (11.91 lb)	8.2 kg (18.1 lb)

### Power and Noise Characteristics

PRODUCT	NO POE LOAD			FULL POE+ LOAD		
	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/HR)	MAX NOISE (DB)	MAX POWER CONSUMPTION (W)	MAX SYSTEM HEAT DISSIPATION (BTU/HR)	MAX NOISE (DB)
FS980M/9	6.3	22	fanless	-	-	-
FS980M/9PS	13	45	37	190	660	49
FS980M/18	12	42	fanless	-	-	-
FS980M/18PS	24	82	33	320	1,100	46
FS980M/28	19	66	fanless	-	-	-
FS980M/28PS	49	170	36	520	1,800	49
FS980M/28DP	49	170	36	520	1,800	49
FS980M/52	36	120	34	-	-	-
FS980M/52PS	63	210	36	540	1,800	49

### Power over Ethernet specifications

PRODUCT	CONNECTED PSU	POE POWER BUDGET(W)	SYSTEM/POE REDUNDANCY	MAX POE ENABLED PORTS AT 7.0W PER PORT	MAX POE ENABLED PORTS AT 15.4W PER PORT	MAX POE+ ENABLED PORTS AT 30W PER PORT
FS980M/9PS	1	150	-	8	8	4
FS980M/18PS	1	250	-	16	16	8
FS980M/28PS	1	375	-	24	24	12
FS980M/28DP	1	375	-	24	24	12
	2		Yes			
FS980M/52PS	1	375	-	48	24	12

### Latency

PRODUCT	64byte			1518byte		
	10Mbps	100Mbps	1000Mbps	10Mbps	100Mbps	1000Mbps
FS980M/9	24.45µs	4.50µs	-	24.58µs	4.474µs	-
FS980M/9PS	24.45µsc	4.50µs	-	24.58µs	4.474µs	-
FS980M/18	82.05µs	10.05µs	3.44µs	1,245.36µs	126.64µs	15.20µs
FS980M/18PS	82.05µs	10.05µs	3.44µsc	1,245.36µs	126.64µs	15.20µsc
FS980M/28	80.20µs	9.94µs	3.23µs	1,234.27µs	126.72µs	15.01µs
FS980M/28PS	80.05µs	9.91µs	3.24µs	1,243.55µs	126.72µs	15.01µs
FS980M/28DP	80.05µs	9.91µs	3.24µs	1,243.55µs	126.72µs	15.01µs
FS980M/52	80.11µs	9.96µs	3.23µs	1,234.36µs	126.74µs	15.01µs
FS980M/5PS	80.61µs	9.91µs	3.24µs	1,243.28µs	126.76µs	15.01µs

## Performance

- ▶ 4 Gbps of stacking bandwidth
- ▶ 10KB L2 jumbo frames
- ▶ Wirespeed multicasting
- ▶ Up to 16K MAC addresses
- ▶ 512 MB DDR2 SDRAM
- ▶ 128 MB flash memory

## Power Characteristics

- ▶ FS980M/9 and FS980M/18 100-240VAC, 0.9A maximum, 50/60Hz
- ▶ FS980M/9PS 100-240VAC, 3.9A maximum, 50/60Hz
- ▶ FS980M/18PS 100-240VAC, 4.0A maximum, 50/60Hz
- ▶ FS980M/28 and FS980M/52 100-240VAC, 1.5A maximum, 50/60Hz
- ▶ FS980M/28PS and FS980M/52PS 100-240VAC, 8.0A maximum, 50/60Hz
- ▶ FS980M/28DP 100-240AP, 8.0A maximum, 50/60Hz

## Diagnostic Tools

- ▶ Find-me device locator
- ▶ Automatic link flap detection and port shutdown
- ▶ Optical Digital Diagnostic Monitoring (DDM)
- ▶ Ping polling for IPv4 and IPv6
- ▶ Port mirroring
- ▶ TraceRoute for IPv4 and IPv6
- ▶ UniDirectional Link Detection (UDLD)

## IP Features

- ▶ RIP and static routing for IPv4 (16 routes)
- ▶ Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
- ▶ NTP client
- ▶ Log to IPv6 hosts with Syslog v6
- ▶ IPv6 Ready certified

## Management

- ▶ Allied Telesis Autonomous Management Framework (AMF) enables powerful centralized management and zero-touch device installation and recovery
- ▶ Console management port on the front panel for ease of access
- ▶ Eco-friendly mode allows ports and LEDs to be disabled to save power
- ▶ Industry-standard CLI with context-sensitive help
- ▶ Powerful CLI scripting engine
- ▶ Comprehensive SNMP MIB support for standards-based device management
- ▶ Built-in text editor
- ▶ Event-based triggers allow user-defined scripts to be executed upon selected system events

## Quality of Service (QoS)

- ▶ 8 priority queues with a hierarchy of high priority queues for real time traffic, and mixed scheduling, for each switch port
- ▶ Limit bandwidth per port or per traffic class down to 64kbps
- ▶ Wirespeed traffic classification with low latency essential for VoIP and real-time streaming media applications
- ▶ Policy-based QoS based on VLAN, port, MAC and general packet classifiers

- ▶ Policy-based storm protection
- ▶ Extensive remarking capabilities
- ▶ Taildrop for queue congestion control
- ▶ Strict priority, weighted round robin or mixed scheduling
- ▶ IP precedence and DiffServ marking based on layer 2, 3 and 4 headers

## Resiliency Features

- ▶ Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
- ▶ Dynamic link failover (host attach)
- ▶ Ethernet Protection Switched Ring (EPSRing™)
- ▶ Link aggregation (LACP) on LAN ports
- ▶ Loop protection: loop detection and thrash limiting
- ▶ PVST+ compatibility mode
- ▶ Spanning Tree (STP, RSTP, MSTP)
- ▶ STP root guard

## Security Features

- ▶ Access Control Lists (ACLs) based on layer2, 3 and 4 headers
- ▶ ACL Groups enable multiple hosts/ports to be included in a single ACL, reducing configuration
- ▶ Auth-fail and guest VLANs
- ▶ Authentication, Authorization and Accounting (AAA)
- ▶ Bootloader can be password protected for device security
- ▶ BPDU protection
- ▶ DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)
- ▶ Dynamic VLAN assignment
- ▶ Network Access and Control (NAC) features manage endpoint security
- ▶ Port-based learn limits (intrusion detection)
- ▶ Private VLANs provide security and port isolation for multiple customers using the same VLAN
- ▶ Secure Copy (SCP)
- ▶ Strong password security and encryption
- ▶ Tri-authentication: MAC-based, web-based and IEEE 802.1x

## Environmental Specifications

- ▶ Operating ambient temp. 0°C to 50°C (32°F to 122°F)
- ▶ Storage temp. -20°C to 60°C (-4°F to 140°F)
- ▶ Operating humidity 5% to 90% non-condensing
- ▶ Storage humidity 5% to 95% non-condensing
- ▶ Maximum Operating Altitude: 3048 m (10,000 ft)

## Safety and Electromagnetic Emissions

- ▶ EMI: FCC part15 B, EN55022 Class A, CISPR22:2006, VCCI Class A, C-Tick, EN 55024
- ▶ Safety: UL 60950-1 Ed2, C22.2 NO.60950-1, EN 60950-1 Ed2, IEC60950-1 Ed.2, EN60950-1 Ed2

## Compliance

- ▶ Compliance Marks : CE, cULus, TUV
- ▶ EU RoHS compliant

<sup>1</sup> AMF edge is for products used at the edge of the network, and only support a single AMF link. They cannot use cross links or virtual links.

## Standards and Protocols

### Cryptographic Algorithms

#### FIPS Approved Algorithms

Encryption (Block Ciphers):

- ▶ AES (ECB, CBC, CFB and OFB Modes)
- ▶ 3DES (ECB, CBC, CFB and OFB Modes)

Block Cipher Modes:

- ▶ CCM
- ▶ CMAC

- ▶ GCM
- ▶ XTS

Digital Signatures & Asymmetric Key Generation:

- ▶ DSA
- ▶ ECDSA

- ▶ RSA

Secure Hashing:

- ▶ SHA-1
- ▶ SHA-2 (SHA-224, SHA-256, SHA-384, SHA-512)

Message Authentication:

- ▶ HMAC (SHA-1, SHA-2(224, 256, 384, 512))

Random Number Generation:

- ▶ DRBG (Hash, HMAC and Counter)

### Non FIPS Approved Algorithms

RNG (AES128/192/256)

DES  
MD5

### Ethernet Standards

- IEEE 802.2 Logical Link Control (LLC)
- IEEE 802.3 Ethernet
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3af Power over Ethernet (PoE)
- IEEE 802.3at Power over Ethernet plus (PoE+)
- IEEE 802.3x Flow control - full-duplex operation
- IEEE 802.3z 1000BASE-X

### IPv4 Features

- RFC 768 User Datagram Protocol (UDP)
- RFC 791 Internet Protocol (IP)
- RFC 792 Internet Control Message Protocol (ICMP)
- RFC 793 Transmission Control Protocol (TCP)
- RFC 826 Address Resolution Protocol (ARP)
- RFC 894 Standard for the transmission of IP datagrams over Ethernet networks
- RFC 919 Broadcasting Internet datagrams
- RFC 922 Broadcasting Internet datagrams in the presence of subnets
- RFC 932 Subnetwork addressing scheme
- RFC 950 Internet standard subnetting procedure
- RFC 1027 Proxy ARP
- RFC 1035 DNS client
- RFC 1042 Standard for the transmission of IP datagrams over IEEE 802 networks
- RFC 1071 Computing the Internet checksum
- RFC 1122 Internet host requirements
- RFC 1191 Path MTU discovery
- RFC 1256 ICMP router discovery messages
- RFC 1518 An architecture for IP address allocation with CIDR
- RFC 1519 Classless Inter-Domain Routing (CIDR)
- RFC 1591 Domain Name System (DNS)
- RFC 1812 Requirements for IPv4 routers
- RFC 1918 IP addressing
- RFC 2581 TCP congestion control

### IPv6 Features

- RFC 1981 Path MTU discovery for IPv6
- RFC 2460 IPv6 specification
- RFC 2464 Transmission of IPv6 packets over Ethernet networks
- RFC 2711 IPv6 router alert option
- RFC 3484 Default address selection for IPv6

RFC 3587	IPv6 global unicast address format
RFC 3596	DNS extensions to support IPv6
RFC 4007	IPv6 scoped address architecture
RFC 4193	Unique local IPv6 unicast addresses
RFC 4291	IPv6 addressing architecture
RFC 4443	Internet Control Message Protocol (ICMPv6)
RFC 4861	Neighbor discovery for IPv6
RFC 4862	IPv6 Stateless Address Auto-Configuration (SLAAC)
RFC 5014	IPv6 socket API for source address selection
RFC 5095	Deprecation of type 0 routing headers in IPv6

## Management

AMF edge node <sup>1</sup>	
AT Enterprise MIB including AMF MIB and SNMP traps	
SNMPv1, v2c and v3	
IEEE 802.1AB Link Layer Discovery Protocol (LLDP)	
RFC 1155	Structure and identification of management information for TCP/IP-based Internets
RFC 1157	Simple Network Management Protocol (SNMP)
RFC 1212	Concise MIB definitions
RFC 1213	MIB for network management of TCP/IP-based Internets: MIB-II
RFC 1215	Convention for defining traps for use with the SNMP
RFC 1227	SNMP MUX protocol and MIB
RFC 1239	Standard MIB
RFC 2578	Structure of Management Information v2 (SMIv2)
RFC 2579	Textual conventions for SMIv2
RFC 2580	Conformance statements for SMIv2
RFC 2674	Definitions of managed objects for bridges with traffic classes, multicast filtering and VLAN extensions
RFC 2741	Agent extensibility (AgentX) protocol
RFC 2819	RMON MIB (groups 1,2,3 and 9)
RFC 2863	Interfaces group MIB
RFC 3411	An architecture for describing SNMP management frameworks
RFC 3412	Message processing and dispatching for the SNMP
RFC 3413	SNMP applications
RFC 3414	User-based Security Model (USM) for SNMPv3
RFC 3415	View-based Access Control Model (VACM) for SNMP
RFC 3416	Version 2 of the protocol operations for the SNMP
RFC 3417	Transport mappings for the SNMP
RFC 3418	MIB for SNMP
RFC 3621	Power over Ethernet (PoE) MIB
RFC 3635	Definitions of managed objects for the Ethernet-like interface types
RFC 3636	IEEE 802.3 MAU MIB
RFC 4022	MIB for the Transmission Control Protocol (TCP)
RFC 4113	MIB for the User Datagram Protocol (UDP)
RFC 4188	Definitions of managed objects for bridges
RFC 4292	IP forwarding table MIB
RFC 4293	MIB for the Internet Protocol (IP)
RFC 4318	Definitions of managed objects for bridges with RSTP
RFC 4560	Definitions of managed objects for remote ping, traceroute and lookup operations
RFC 5424	Syslog protocol

## Multicast Support

IGMP query solicitation	
IGMP snooping (IGMPv1, v2 and v3)	
IGMP snooping fast-leave	
MLD snooping (MLDv1 and v2)	
RFC 2715	Interoperability rules for multicast routing protocols
RFC 3306	Unicast-prefix-based IPv6 multicast addresses
RFC 4541	IGMP and MLD snooping switches

## Quality of Service (QoS)

IEEE 802.1p	Priority tagging
RFC 2211	Specification of the controlled-load network element service
RFC 2474	DiffServ precedence for eight queues/port
RFC 2475	DiffServ architecture
RFC 2597	DiffServ Assured Forwarding (AF)
RFC 2697	A single-rate three-color marker
RFC 2698	A two-rate three-color marker
RFC 3246	DiffServ Expedited Forwarding (EF)

## Resiliency

IEEE 802.1AX	Link aggregation (static and LACP)
IEEE 802.1D	MAC bridges
IEEE 802.1s	Multiple Spanning Tree Protocol (MSTP)
IEEE 802.1w	Rapid Spanning Tree Protocol (RSTP)
IEEE 802.3ad	Static and dynamic link aggregation

## Routing Information Protocol (RIP)

RFC 1058	Routing Information Protocol (RIP)
RFC 2082	RIP-2 MD5 authentication
RFC 2453	RIPv2

## Security

SSH remote login	
SSLv2 and SSLv3	
TACACS+ Accounting, Authentication	
IEEE 802.1X authentication protocols (TLS, TTLS, PEAP and MD5)	
IEEE 802.1X multi-suplicant authentication	
IEEE 802.1X port-based network access control	
RFC 2560	X.509 Online Certificate Status Protocol (OCSP)
RFC 2818	HTTP over TLS ("HTTPS")
RFC 2865	RADIUS authentication
RFC 2866	RADIUS accounting
RFC 2868	RADIUS attributes for tunnel protocol support
RFC 2986	PKCS #10: certification request syntax specification v1.7

RFC 3546	Transport Layer Security (TLS) extensions
RFC 3579	RADIUS support for Extensible Authentication Protocol (EAP)
RFC 3580	IEEE 802.1x RADIUS usage guidelines
RFC 3748	PPP Extensible Authentication Protocol (EAP)
RFC 4251	Secure Shell (SSHv2) protocol architecture
RFC 4252	Secure Shell (SSHv2) authentication protocol
RFC 4253	Secure Shell (SSHv2) transport layer protocol
RFC 4254	Secure Shell (SSHv2) connection protocol
RFC 5246	Transport Layer Security (TLS) v1.2
RFC 5280	X.509 certificate and Certificate Revocation List (CRL) profile
RFC 5425	Transport Layer Security (TLS) transport mapping for Syslog
RFC 5656	Elliptic curve algorithm integration for SSH
RFC 6125	Domain-based application service identity within PKI using X.509 certificates with TLS
RFC 6614	Transport Layer Security (TLS) encryption for RADIUS
RFC 6668	SHA-2 data integrity verification for SSH

## Services

RFC 854	Telnet protocol specification
RFC 855	Telnet option specifications
RFC 857	Telnet echo option
RFC 858	Telnet suppress go ahead option
RFC 1091	Telnet terminal-type option
RFC 1350	Trivial File Transfer Protocol (TFTP)
RFC 1985	SMTP service extension
RFC 2049	MIME
RFC 2131	DHCPv4 client
RFC 2616	Hypertext Transfer Protocol - HTTP/1.1
RFC 2821	Simple Mail Transfer Protocol (SMTP)
RFC 2822	Internet message format
RFC 4330	Simple Network Time Protocol (SNTP) version 4
RFC 5905	Network Time Protocol (NTP) version 4

## VLAN Support

IEEE 802.1Q	Virtual LAN (VLAN) bridges
IEEE 802.1v	VLAN classification by protocol and port
IEEE 802.3ac	VLAN tagging

## Voice over IP (VoIP)

LLDP-MED	ANSI/TIA-1057
Voice VLAN	



## Ordering Information

### AT-FS980M/9-xx<sup>2</sup>

8-port 10/100TX switch with 1 Gigabit/SFP combo uplinks and one fixed AC power supply

### AT-FS980M/9PS-xx<sup>2</sup>

8-port 10/100TX PoE switch with 1 Gigabit/SFP combo uplinks and one fixed AC power supply

### AT-FS980M/18-xx<sup>2</sup>

16-port 10/100TX switch with 2 Gigabit/SFP combo uplinks and one fixed AC power supply

### AT-FS980M/18PS-xx<sup>2</sup>

16-port 10/100TX PoE switch with 2 Gigabit/SFP combo uplinks and one fixed AC power supply

### AT-FS980M/28-xx

24-port 10/100TX switch with 4 SFP uplinks and one fixed AC power supply

### AT-FS980M/28PS-xx

24-port 10/100TX PoE+ switch with 4 SFP uplinks and one fixed AC power supply

### AT-FS980M/28DP-xx

24-port 10/100TX PoE+ switch with 4 SFP uplinks and dual fixed AC power supply

### AT-FS980M/52-xx

48-port 10/100TX switch with 4 SFP uplinks and one fixed AC power supply

### AT-FS980M/52PS-xx

48-port 10/100TX PoE+ switch with 4 SFP uplinks and one fixed AC power supply

### AT-BRKT-J22

Wall-mount kit for FS980M/9, 9PS, 18, 18PS, 28, 28PS, 52, 52PS

<sup>2</sup>Rackmount kit is included

Where xx = 10 for US power cord  
20 for no power cord  
30 for UK power cord  
40 for Australian power cord  
50 for European power cord

## Feature Licenses

NAME	DESCRIPTION	INCLUDES
AT-FL-FS98-UDLD	UniDirectional Link Detection	▶ UDLD

## Small Form Pluggable (SFP) Optics Modules

### 1000Mbps SFP modules

#### AT-SPSX

1000SX GbE multi-mode 850 nm fiber up to 550 m

#### AT-SPEX

1000X GbE multi-mode 1310 nm fiber up to 2 km

#### AT-SPLX10

1000LX GbE single-mode 1310 nm fiber up to 10 km

#### AT-SPLX40

1000LX GbE single-mode 1310 nm fiber up to 40 km

#### AT-SPZX80

1000ZX GbE single-mode 1550 nm fiber up to 80 km

#### AT-SPBD10-13

1000LX GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

#### AT-SPBD10-14

1000LX GbE Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 10 km

#### AT-SPBD20-13/I

1000BX GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 20 km

#### AT-SPBD20-14/I

1000BX GbE Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 20 km

#### AT-SPSX/I

1000SX GbE multi-mode 850 nm fiber up to 550m Industrial Temperature

#### AT-SPLX10/I

1000LX GbE single-mode 1310 nm fiber up to 10 km industrial temperature

#### AT-SPTX<sup>3</sup>

1000T 100m copper

<sup>3</sup> Supported on 28 and 52 port models

## 100Mbps SFP Modules

### AT-SPFX/2

100FX multi-mode 1310 nm fiber up to 2 km

### AT-SPFX/15

100FX single-mode 1310 nm fiber up to 15 km

### AT-SPFXBD-LC-13

100BX Bi-Di (1310 nm Tx, 1550 nm Rx) fiber up to 10 km

### AT-SPFXBD-LC-15

100BX Bi-Di (1550 nm Tx, 1310nm Rx) fiber up to 10 km

## Stacking modules

### AT-SP10TW1

Direct attach stacking cable (1.0m)